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AEROSPACE MEDICINE AND BIOLOGY

A CONTINUING BIBLIOGRAPHY WITH INDEXES

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Typical Report Citation and Abstract

❶ **19970001126** NASA Langley Research Center, Hampton, VA USA
❷ **Water Tunnel Flow Visualization Study Through Poststall of 12 Novel Planform Shapes**
❸ Gatlin, Gregory M., NASA Langley Research Center, USA Neuhart, Dan H., Lockheed Engineering and Sciences Co., USA;
❹ Mar. 1996; 130p; In English
❺ Contract(s)/Grant(s): RTOP 505-68-70-04
❻ Report No(s): NASA-TM-4663; NAS 1.15:4663; L-17418; No Copyright; Avail: CASI; A07, Hardcopy; A02, Microfiche
❼ To determine the flow field characteristics of 12 planform geometries, a flow visualization investigation was conducted in the Langley 16- by 24-Inch Water Tunnel. Concepts studied included flat plate representations of diamond wings, twin bodies, double wings, cutout wing configurations, and serrated forebodies. The off-surface flow patterns were identified by injecting colored dyes from the model surface into the free-stream flow. These dyes generally were injected so that the localized vortical flow patterns were visualized. Photographs were obtained for angles of attack ranging from 10’ to 50’, and all investigations were conducted at a test section speed of 0.25 ft per sec. Results from the investigation indicate that the formation of strong vortices on highly swept forebodies can improve poststall lift characteristics; however, the asymmetric bursting of these vortices could produce substantial control problems. A wing cutout was found to significantly alter the position of the forebody vortex on the wing by shifting the vortex inboard. Serrated forebodies were found to effectively generate multiple vortices over the configuration. Vortices from 65’ swept forebody serrations tended to roll together, while vortices from 40’ swept serrations were more effective in generating additional lift caused by their more independent nature.
❽ Author
❾ *Water Tunnel Tests; Flow Visualization; Flow Distribution; Free Flow; Planforms; Wing Profiles; Aerodynamic Configurations*

Key

1. Document ID Number; Corporate Source
2. Title
3. Author(s) and Affiliation(s)
4. Publication Date
5. Contract/Grant Number(s)
6. Report Number(s); Availability and Price Codes
7. Abstract
8. Abstract Author
9. Subject Terms

AEROSPACE MEDICINE AND BIOLOGY

A Continuing Bibliography (Suppl. 459)

FEBRUARY 23, 1998

51
LIFE SCIENCES (GENERAL)

19980006400

Influence of the N-source concentration on xanthan fed-batch fermentation

Zhao, Xueming, Tianjin Univ., China; Ma, Hongwu; Huang, Xiao; Ban, Rui; Huagong Xuebao/Journal of Chemical Industry and Engineering (China); April, 1997; ISSN 0438-1157; Volume 48, no. 2, pp. 247-251; In Chinese; Copyright; Avail: Issuing Activity

Using (NH(sub 4))(sub 2)SO(sub 4) as the N-source, the effect of the initial N-source concentration on xanthan fed-batch fermentation was studied. The best concentration was about 4g/l. This result was compared with previous studies. The oxygen limitation and the stagnant zone might be the main reason for the decrease of the production rate in high cell concentration. by improving the oxygen supply capacity of the equipment, optimizing the N-source concentration and fed-batch control of glucose concentration, xanthan concentration is 40g/l achieved in 55 hours.

Author (revised by EI)

Gums (Substances); Fermentation; Organic Chemistry; Nitrogen; Density (Mass/Volume); Liquids

19980006571 Department of Health and Human Services, National Toxicology Program, Research Triangle Park, NC USA

Toxicology and Carcinogenesis Studies of Scopolamine Hydrobromide Trihydrate (CAS No. 6533-68-2) in F344/N Rats and B6C3F1 Mice (Gavage Studies)

Mar. 1997; 261p; In English

Report No.(s): PB97-208946; NTP-TR-445; NIH/PUB-97-3361; No Copyright; Avail: CASI; A12, Hardcopy; A03, Microfiche

Scopolamine hydrobromide trihydrate is used in ophthalmic preparations and as a preanesthetic sedative. Its major use is in transdermal patches for the treatment of motion sickness. Scopolamine hydrobromide trihydrate was selected for study because of considerable human exposure resulting from its use in prescription and over-the-counter preparations. Scopolamine was a suspect carcinogen because it contains an aliphatic epoxide moiety which may act as a biological alkylating agent. Male and female F344/N rats and B6C3F1 mice received scopolamine hydrobromide trihydate (89% pure) in distilled water by gavage for 16 days, 14 weeks, or 2 years. Genetic toxicology studies were conducted in Salmonella typhimurium cultured Chinese hamster ovary cells, and mouse peripheral blood erythrocytes.

NTIS

Toxicity; Hydrobromides; Hyoscine; Carcinogens

19980006600 Bureau of Reclamation, Technical Service Center, Denver, CO USA

Comparison of Rapid Toxicity Tests with a Standard Acute Test

Nelson, S. M., Bureau of Reclamation, USA; Roline, R. A., Bureau of Reclamation, USA; Apr. 02, 1997; 14p; In English

Report No.(s): PB97-158919; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Rapid bioassays (those requiring less than or equal to 24 hours to complete) including IQ Toxicity Test, MetPLATE, a rotifer test, and Microtox were compared with standard 48-hour Ceriodaphina dubia test when exposed to six different chemicals. Tests that we used were those that could be obtained 'off the shelf' from commercial vendors and included: a 1-hour enzymatic inhibition test using the daphnid C. dubia; a three-hour enzymatic inhibition microplate assay with the bacteria Escherichia coli; and a 24-hour mortality test with the rotifer, Brachionus calyciflorus. We also obtained toxicity data for Microtox, a microbial test, from the literature for comparison with the above tests. Mortality results, from 24-hour, C. dubia tests are also reported. Our objective was to rank the sensitivity of these 'rapid tests' compared with the standard 48-hour C. dubia mortality test.

NTIS

Bioassay; Toxicity; Test Facilities

19980006658

Theory and experiments on temperature oscillations effects in living tissues

Liu, Jing, Tsinghua Univ., China; Wang, Cuncheng; Ren, Zepei; Sun, Xingguo; Zhang, Xuexue; Qinghua Daxue Xuebao/Journal of Tsinghua University; February, 1997; ISSN 1000-0054; Volume 37, no. 2, pp. 91-95; In Chinese; Copyright; Avail: Issuing Activity

The mechanisms of a very important thermophysical phenomenon well known as temperature oscillations effects in living tissues are investigated. Ideas on establishing the new temperature oscillation theory are introduced. Technical routes for designing the simulation and animal in vivo experiments aiming at verifying the theory are illustrated and the new phenomena observed in the experiments as well as the corresponding conclusions are reported. The physical process of a few thermal life phenomena previously observed in animal experiments are interpreted. This may surely compel people re-consider the bioheat transfer itself thoroughly and modify some of the classical models and then promote them to the new clinical usage.

Author (revised by EI)

Temperature Effects; Bioengineering; Tissues (Biology)

19980006861 Kansas State Univ., Office of Research and Sponsored Programs, Manhattan, KS USA

Effects of Silver and Other Metals on the Cytoskeleton *Final Report, 15 Feb. 1995 - 30 Jun. 1997*

Conrad, Gary W., Kansas State Univ., USA; Dec. 23, 1997; 15p; In English

Contract(s)/Grant(s): NASA Order 5-30620; NAGw-4491

Report No.(s): NASA/CR-97-206503; NAS 1.26:206503; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Directly or indirectly, trace concentrations of silver ion (Ag(+)) stabilize microtubules (Conrad, A.H., et al. Cell Motil. & Cytoskel. 27:117-132), as does taxol (Conrad, A.H., et al. J. Exp. Zool. 262:154-165), an effect with major consequences for cellular shape changes and development. Polymerization of microtubules is gravity-sensitive (Tabony and Job, Proc. Natl. Acad. Sci. USA 89:6948-6952), so trace amounts of Ag(+) may alter cellular ability to respond to gravity. If Ag electrolysis is used to purify water on NASA space vehicles, plants and animals/astronauts will be exposed continuously to Ag(+), a regimen with unknown cellular and developmental consequences. Fertilized eggs of the marine mudsnail, Ilyanassa obsoleta, are the cells in which the effects of A(+) on microtubules were discovered. They distribute visible cytoplasmic contents according to gravity and contain cytoplasmic morphogenetic determinants for heart development. The objectives are to determine if the effects of Ag(+), AU(3+), (of biosensor relevance), or Gd(3+) (inhibitor of some stretch-activated ion channels) on the cytoskeleton (in the presence and absence of mechanical loading) will affect cellular responses to gravity.

Author

Silver; Cytoplasm; Metal Ions; Polymerization; Bioinstrumentation; Electrolysis; Cells (Biology)

19980008287

Computer-aided system for the diagnosis of Alzheimer's disease

Kobashi, Syoji, Himeji Inst. of Technology, Japan; Morinaga, Norio; Hirano, Shoji; Kamiura, Naotake; Hata, Yutaka; Yamato, Kazuharu; Ronbunshi); June, 1997; ISSN 0424-7760; Volume 119, no. 4, pp. 32-41; In English; Copyright; Avail: Issuing Activity

One of the most serious problems in medical science is an increment of Alzheimer's disease. It is known that the patient's brain atrophy is a result of neural cell loss. It is useful for the diagnosis of Alzheimer's disease to measure the volumes of the brain portions and to display them. We can obtain anatomical information from 2D slice images produced by MRI. We propose a computer-aided system for the diagnosis of Alzheimer's disease. The system consists of: (1) extraction of the portions from MRI data, (2) measurement of the volumes of the portions and then displaying them, and (3) user interface for a medical doctor. In this paper we describe procedures for the above. For extraction of the brain portions we propose the method based on standard region growing algorithm and the method of figure decomposition using the distance value. Comparison of the volumes of our extracted portions with volumes manually measured by a physician shows that the error rate, on the average, is 1.74% for 48 MRI data. We also discuss the 3D display, the measuring range, and the construction of the user interface for a physician.

Author (EI)

Computer Techniques; Diagnosis; Diseases; Imaging Techniques; Magnetic Resonance; Medical Equipment; Human-Computer Interface

19980008579

Modelling and phase analysis of immunological process at primary immune response

Edissonov, Ivan, Bulgarian Acad. of Sciences, Bulgaria; Systems Analysis Modelling Simulation; 1997; ISSN 0232-9298; Volume 28, no. 1-4, pp. 77-91; In English; Copyright; Avail: Issuing Activity

A mathematical model of a specific immunological process in the venous immunization of rabbits with haemorrhagic disease virus is developed. On the basis of the qualitative theory of ordinary differential equations a phase analysis of this immunological process is carried out in the kinetic variables plane-antigens concentration and antibodies concentration. The phase portrait of the discussed nonlinear model in the two-dimensional domain is constructed. The mutual relationship between the antigens reproduction rate and phase portrait type is investigated in a qualitative way.
Author (EI)

Physiological Responses; Antibodies; Antigens; Immunology; Mathematical Models; Differential Equations

19980008948

Jamming avoidance responses in weakly electric fishes: A biological view of signal processing

Kawasaki, Masashi, Univ. of Virginia, USA; Computer Sciences; June, 1997; ISSN 0916-8508; Volume E80-A, no. 6, pp. 943-950; In English; Copyright; Avail: Issuing Activity

Electric fishes generate an AC electric field around themselves by the electric organ in the tail. Spatial distortion of the field by nearby objects is detected by an electroreceptor array located all over the body surface to localize the object electrically when other senses such as vision and mechanosense are useless. Each fish has its own 'frequency band' for its electric organ discharges, and jamming of the electrolocation system occurs when two fish with similar discharge frequencies encounter. to avoid jamming, the fish shift their discharge frequencies in appropriate directions. A computational algorithm for this electrical behavior and its neuronal implementation by the brain have been discovered. The design features of the system, however, are rather complex for this simple behavior and cannot be readily explained by functional optimization processes during evolution. to gain insights into the origin of the design features, two independently evolved electric fish species which perform the same behavior are compared. Complex features of the neuronal computation may be explained by the evolutionary history of neuronal elements.
Author (EI)

Signal Processing; Systems Analysis; Biology; Communication; Bioelectricity; Electric Fields; Electric Discharges

19980008960

Human sleep electroencephalogram analysis based on the instantaneous maximum entropy method

Uchida, Sunao, Tokyo Int. of Psychiatry, Japan; Takizawa, Yumi; Hirai, Nobuhide; Ishiguro, Makio; Computer Sciences; June, 1997; ISSN 0916-8508; Volume E80-A, no. 6, pp. 965-970; In English; Copyright; Avail: Issuing Activity

Analysis of electroencephalogram (EEG) is presented for sleep physiology. This analysis is performed by the Instantaneous Maximum Entropy Method (IMEM), which was given by the author. Appearance and continuation of featuristic waves are not steady in EEG. The characteristics of these waves responding to epoch of sleep are analyzed. The behaviors of waves were clarified by this analysis as follows; (a) time dependent frequency of continuous oscillations of alpha rhythm was observed precisely. Sleep spindles were detected clearly within NREM and these parameters of time, frequency, and peak energy were specified. (b) delta waves with very low frequencies and sleep spindles were observed simultaneously. And (c) the relationship of sleep spindles and delta waves was first detected with negative correlation along time-axis. The analysis by the IMEM was found effective comparing conventional analysis method of FFT, bandpass filter bank, etc.
Author (EI)

Eye Movements; Maximum Entropy Method; Electroencephalography; Research; Sleep; Signal Processing; Fast Fourier Transformations; Frequencies

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AEROSPACE MEDICINE

Includes physiological factors; biological effects of radiation; and effects of weightlessness on man and animals.

19980006570 Center for Health Policy Studies, Columbia, MD USA
Partners in Research Identifying Common Interests ***Final Report***
Jun. 16, 1997; 106p; In English
Report No.(s): PB97-205074; No Copyright; Avail: CASI; A06, Hardcopy; A02, Microfiche

The Agency for Health Care Policy and Research (AHCPR) undertook this project to develop a methodology for systematically matching research interests of private sector organizations with its own in order to identify potential research partners. The methodology was developed in several stages: (1) a segmentation was developed to classify private sector entities by research focus; (2) a matrix identified promising overlap between private sector research and AHCPR research interests; and (3) sample profiles were developed for nine organizations in four health industry segments (pharmaceutical/biotechnology; manufacturing/suppliers; health information systems; and philanthropy). The profiles were created for Amgen, Bristol Myers Squibb, Eli Lilly, American Home Products, Medtronic, HCIA, HBO and Company, and the California Endowment. These profiles demonstrate how available sources of information on organizations can be tapped to provide a detailed background for screening these organizations to assess opportunities for research partnering.
NTIS
Research Projects; Health; Services; Technologies

19980006767 Institute of Space Medico, Beijing, China
Space Medicine and Medical Engineering, Volume 9 ***Hangtian Yixue Yu Yixue Gongcheng***
Wei, J., Institute of Space Medico, China; Aug. 1996; 84p; In English; In Chinese; Portions of this document are not fully legible; See also PB93-177731 and N96-24107
Report No.(s): PB96-209408; No Copyright; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Microfiche

Contents include the following: Influence of Human Factors on Performance of Chinese Speech Recognition Systems; Changes in Spectra of Heart Rate and Blood Pressure Variabilities during Bed Rest and Head - up Tilt after Bed Rest; Removal of CO2, Moisture and Heat from Ventilated Suit under Different Pressures; Changes of Brain Potentials Related to Visual Attention during Simulated Weightlessness; Effects of Simulated Weightlessness on Ultrastructures and Oxygen Supply and Consumption of Myocardium in Rats; Relationship Between Particle Fluence and Dosage in Cabin of Recoverable Satellite; Observation of Inner Ear Injury after Landing Impact in Sitting Position in Rhesus Monkeys; Relationship between the State of Intravascular Bubbles and Microcirculation System; Study on Changes of Visual Fatigue Index during Prolonged Visual Display Terminal Operation; Effects of Frostbite on Some Factors of Blood Coagulation System in Rats under Hypoxia; Effects of Freezing and Hypoxia on Serum Creatine Kinase Activity in Rats; Human Reliability in Manned Spaceflight; Combustion under Microgravity and Technique of Fire Prevention and Suppression in Space Cabin.
NTIS
Aerospace Medicine; Attitude (Inclination); Bed Rest; Blood Coagulation; Blood Pressure; Brain; Bubbles; Carbon Dioxide; Combustion; Creatine; Display Devices; Dosage; Ear; Fire Prevention

19980006902
Longitudinal vibration response of a curved fiber used for laser ultrasound surgical therapy
Makarov, S. N., State St. Petersburg Univ., Russian Federation; Ochmann, M.; Desinger, K.; Journal of the Acoustical Society of America; August, 1997; ISSN 0001-4966; Volume 102, no. 2 pt 1, pp. 1191-1199; In English; Copyright; Avail: Issuing Activity

The longitudinal vibration response of a bent fiber used as an active element of a medical applicator has been studied. A simple analytical formula has been derived for the transfer function. The behavior of the function has been investigated by considering some fibers with varying lengths. The driven frequency is of about 10-50 kHz. If the displacement at the driven end of the fiber is known, the power output of the applicator can be found from the known values of the tissue impedance and the transfer function.
EI
Vibration Mode; Glass Fibers; Ultrasonic Radiation; Lasers; Surgery; Ultrasonics

19980007399 NERAC, Inc., Tolland, CT USA

Toxicology and Metabolism of Methylene Chloride (Latest Citations from the Life Sciences Collection Database)

Apr. 1996; In English; Page count unavailable

Report No.(s): PB96-869268; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Microfiche

The bibliography contains citations concerning methylene chloride, its effects on biological systems, and its metabolic fate. Both animal and human studies, and case reports are examined for methylene chloride toxicity. Exposure to the chemical through inhalation, ingestion, and contact is examined. Occupational exposure to methylene chloride is included, and risk factors are discussed. Long term carcinogenicity of methylene chloride is also considered. Toxicity of other chlorinated organic compounds is referenced in related bibliographies. (Contains 50-250 citations and includes a subject term index and title list.)

NTIS

Toxicity; Toxicology; Bibliographies; Biological Effects; Methylene; Chlorides

19980008079 Department of Health and Human Services, National Toxicology Program, Research Triangle Park, NC USA

Toxicology and Carcinogenesis Studies of Phenolphthalein (CAS No. 77-09-8) in F344/N Rats and B6C3F1 Mice (Feed Studies)

Nov. 1996; 363p; In English

Report No.(s): PB97-169882; NIH/Pub-97-3390; NTP-TR-465; No Copyright; Avail: CASI; A16, Hardcopy; A03, Microfiche

Under the conditions of these 2-year feed studies, there was clear evidence of carcinogenic activity of phenolphthalein in male F344/N rats based on markedly increased incidences of benign pheochromocytomas of the adrenal medulla and of renal tubule adenomas and adenomas or carcinomas (combined). There was some evidence of carcinogenic activity of phenolphthalein in female F344/N rats based on the increased incidences of benign pheochromocytomas of the adrenal medulla in the 12,000 ppm group and of benign or malignant pheochromocytomas (combined) in the 12,000 and 25,000 ppm groups. There was clear evidence of carcinogenic activity of phenolphthalein in male B6C3F1 mice based on increased incidences of histiocytic sarcomas, malignant lymphomas of all types, lymphomas of thymic origin, and benign sex-cord stromal tumors of the ovary.

NTIS

Carcinogens; Toxicology; Drugs; Rats; Cancer; Tumors

19980008082 Operational Technologies Corp., Dayton, OH USA

Occupational Risk from Chromium ***Final Report, Oct. 1996 - Jul. 1997***

May, Lisa M., Operational Technologies Corp., USA; Hoffman-Till, Theresa A., Operational Technologies Corp., USA; Prince, Joseph K., Operational Technologies Corp., USA; Vermulen, Erik K., Operational Technologies Corp., USA; Larcom, Barbara J., Armstrong Lab., USA; Sep. 1997; 75p; In English

Contract(s)/Grant(s): F41624-94-D-9003; F61424-94-D-9006; AF Proj. 7757

Report No.(s): AD-A329490; NMRI-97-44; AL/OE,XC-TR-1997-0092; No Copyright; Avail: CASI; A04, Hardcopy; A01, Microfiche

U.S. Navy (Navy) operations require the use of chrome (Cr) compounds in its various defense program activities. However, certain forms of Cr have been shown to cause acute and chronic toxicity. A reduction in the OSHA PEL from 0.5 mg/m3 to 0.0005 mg/m3 has been proposed. Accordingly, the Navy and the Department of Defense (DoD) are concerned over the potential for any adverse affect occurring among the exposed personnel. Currently available chrome toxicity information were reviewed and assessed in this report. Existing epidemiological data and pharmacokinetic models suggest that cancer potency may vary with solubility and form of hexavalent chrome. A new analytical method, ID 215, is now available that identifies hexavalent Cr at the proposed levels. Personal samples analyzed using this method were obtained from the Navy Occupational Exposure Database and evaluated. Estimated potential risk to Naval personnel from hexavalent chrome exposure, assuming no personal protective equipment, were in the 1/100 00 range for the majority of the processes monitored. The highest risks calculated were in the 1/100 to 1/1000 range for abrasive blasting using mineral spirits and sand. Several operations, however, would require the use of respiratory protection and, therefore, risk would be expected to be appreciably less. In general, exposure levels analyzed using ID-2l5 method were generally one order of magnitude below current standards.

DTIC

Chromium; Occupational Diseases; Toxicity; Risk; Epidemiology; Pharmacology

19980008119 NERAC, Inc., Tolland, CT USA
Rapid Eye Movement (REM) Sleep (Latest Citations from the Life Sciences Collection Database)
Apr. 1996; In English; Page count unavailable
Report No.(s): PB96-868872; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Microfiche

The bibliography contains citations concerning animal studies of rapid eye movement (REM) in sleep and the results of REM deprivation. The effects of amino acids and other chemicals on REM sleep are discussed, and the psychological effects of decreased REM sleep are also cited. (Contains 50-250 citations and includes a subject term index and title list.)
NTIS
Bibliographies; Eye Movements; Sleep

19980009042 Defence Science and Technology Organisation, Electronics and Surveillance Research Lab., Salisbury, Australia
A Commercial Off The Shelf (COTS) Based Military Telemedicine System
Harrison, G. B., Defence Science and Technology Organisation, Australia; May 1997; 45p; In English
Report No.(s): AD-A329978; DSTO-TR-0512; DODA-AR-010-174; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

An experimental Commercial Off The Shelf (COTS) based telemedicine system was developed in less than three months and tested on HMAS Success during RIMPAC
DTIC
Telemedicine; Medical Services

19980009076 New York Univ. Medical Center, Dept. of Environmental Medicine, New York, NY USA
Pulmonary Effects of Machining Fluid Aerosols *Final Report*
Gordon, T., New York Univ. Medical Center, USA; Jan. 24, 1997; 23p; In English
Contract(s)/Grant(s): NIOSH-R01-OH-03044
Report No.(s): PB97-206353; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The relative toxicity of three major classes of machining fluids (soluble, synthetic and semisynthetic) was compared in an animal model of pulmonary injury and inflammation. Significant differences in toxicity were noted in guinea-pigs after a single 3 hour exposure suggesting that various types of machining fluids may have inherent differences in toxicity in the workplace. Greater toxicity was noted in guinea-pigs exposed for 3 hours to used machining fluid aerosols compared to aerosols of unused fluids. Physicochemical properties of machining fluids were also found to contribute to adverse pulmonary effects. Little to no pulmonary injury or inflammation was noted in guinea-pigs exposed to 5mg/m3 used machining fluid aerosols for 30 days. Three daily exposures of rats to 20mg/m3 used machining fluid aerosols produced a significant increase in stored mucosubstances in the epithelial lining of the intrapulmonary airways and the nasal septum. These findings suggest that irritant components of machining fluids can contribute to the increase in sputum and chronic bronchitis reported for workers exposed to machining fluid aerosols.
NTIS
Toxicity; Aerosols; Machining; Respiratory Diseases

53
BEHAVIORAL SCIENCES

Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

19980006734
Speech enhancement using state-based estimation and sinusoidal modeling
Deisher, Michael E., Arizona State Univ., USA; Spanias, Andreas S.; Journal of the Acoustical Society of America; August, 1997; ISSN 0001-4966; Volume 102, no. 2 pt 1, pp. 1141-1148; In English; Copyright; Avail: Issuing Activity

A new hidden Markov model (HMM)-based speech enhancement scheme is introduced. Noise reduction is achieved by applying the HMM-based minimum mean square error (MMSE) estimator to find the harmonic sinusoidal model parameters of clean speech from speech corrupted by additive noise. The proposed technique is compared to the standard HMM-based approach with respect to average increase in total SNR, segmental SNR and subjective quality. A small gain in average output SNR is

obtained. At 0 dB input SNR, the proposed scheme improved the segmental SNR during voiced speech by as much as 2 dB. Informal listening tests indicate that the low-level residual noise associated with HMM-based algorithms is preceptively reduced.
EI
Sine Waves; State Estimation; Speech; Mathematical Models; Estimating

19980008139 Oklahoma Univ., School of Industrial Engineering, Norman, OK USA
Workshift and Antihistamine Effects on Task Performance ***Final Report***
Gilliland, Kirby, Oklahoma Univ., USA; Schlegel, Robert E., Oklahoma Univ., USA; Nesthus, T. E., Civil Aeromedical Inst., USA; Dec. 1997; 106p; In English
Contract(s)/Grant(s): DTFA02-93-D-93088
Report No.(s): DOT/FAA/AM-97/25; No Copyright; Avail: CASI; A06, Hardcopy; A02, Microfiche

Sixteen male subjects, well-trained on a battery of cognitive performance assessment tasks, participated in a study to investigate the effects on human operator performance of work shift (Day Shift vs. Midshift), a specific antihistamine drug (4 mg of ChlorTrimeton(R) brand chlorpheniramine maleate), and time on task accompanying three successive drug doses spaced every four hours. Five performance tasks, two work sample tasks, and four subjective scales were included in the study. In summary, chlorpheniramine maleate alone had a strong negative influence on a wide range of task performance and mood measures. There was a rather complex relationship between work shift and time on the shift such that performance and mood during the Day Shift tended to get better and during the Midshift tended to get worse. No evidence was found that chlorpheniramine maleate and work shift combine to produce a multiplicative effect.
Author
Antihistaminics; Human Performance; Mental Performance; Operator Performance; Tasks; Work Capacity; Drugs; Males

19980008810 Civil Aeromedical Inst., Oklahoma City, OK USA
Automation in General Aviation: Two Studies of Pilot Responses to Autopilot Malfunctions ***Final Report***
Beringer, Dennis B., Civil Aeromedical Inst., USA; Harris, Howard C., Jr., Civil Aeromedical Inst., USA; Dec. 1997; 30p; In English
Report No.(s): DOT/FAA/AM-97/24; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

Study 1 examined four automation-related malfunctions (runaway pitch-trim up, roll servo failure, roll sensor failure, pitch drift up) and subsequent pilot responses. Study 2 examined four additional malfunctions; two more immediately obvious (runaway pitch-trim down, runaway roll servo) and two subtler (failed attitude indicator, pitch sensor drift down) than those in Study 1, and the effect of an auditory warning. Data collection was performed in the Civil Aeromedical Institute's Advanced General Aviation Research Simulator, configured as a Piper Malibu. Results suggest that maladaptive responses to some of these failures may, in a significant percentage of cases, lead to significant altitude loss, overstress of the airframe, disorientation of the pilot, or destruction of the aircraft. Percentages of successful recoveries, detection/correction times, and related indices of performance are discussed in the context of malfunction type, flight profile, and auditory alerts.
Author
Automatic Pilots; Simulators; General Aviation Aircraft; Attitude Indicators; Malfunctions; Flight Paths; Failure; Roll; Disorientation; Data Acquisition

19980009034 Tulane Univ., Office of Research, New Orleans, LA USA
Computational Modelling of Equiluminant Vision ***Final Report, 1 Sep. 1993 - 1 Sep. 1994***
Zimmerman, G. L., Tulane Univ., USA; Jan. 1995; 6p; In English
Contract(s)/Grant(s): F49620-93-I-0546; AF Proj. 3484
Report No.(s): AD-A329647; AFOSR-TR-97-0462; No Copyright; Avail: CASI; A02, Hardcopy; A01, Microfiche

The goal of this grant was to obtain equipment for studying psychophysical and computational aspects of chromatic motion perception. The equipment consisted of color measurement, data capture, data storage and color presentation devices. Our main results include the influence of luminant motion information on equiluminant motion direction, the impact of equilumance on both page and RSVP reading, the development of computational method to eliminate motion blur, and adaptive computational model of motion perception at equilumance.
DTIC
Visual Perception; Visual Signals; Visual Observation

54
MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing. For related information see also 16 Space Transportation.

19980006557 NERAC, Inc., Tolland, CT USA
Human Factors Engineering (Latest citations from the NTIS Bibliographic Database)
May 1996; In English; Page count unavailable
Report No.(s): PB96-870563; Copyright Waived; Avail: Issuing Activity (Natl Technical Information Service (NTIS)), Microfiche

The bibliography contains citations concerning ergonomic design and engineering studies of man-machine systems. A variety of military and civilian applications is discussed, including current and future human engineering problems and opportunities. Published guides and tutorials are also mentioned. (Contains 50-250 citations and includes a subject term index and title list.)
NTIS
Bibliographies; Man Machine Systems

19980007975 ILC Dover, Frederica, DE USA
NASA Research Announcement Phase 2 Final Report for the Development of a Power Assisted Space Suit Glove *Final Report*
Lingo, Robert, ILC Dover, USA; Cadogan, Dave, ILC Dover, USA; Sanner, Rob, Maryland Univ., USA; Sorenson, Beth, Maryland Univ., USA; Dec. 24, 1997; 25p; In English; Original contains color illustrations
Contract(s)/Grant(s): NASw-96015
Report No.(s): NASA/CR-97-206657; NAS 1.26:206657; No Copyright; Avail: CASI; A03, Hardcopy; A01, Microfiche

The main goal of this program was to develop an unobtrusive power-assisted EVA glove metacarpalphalangeal (MCP) joint that could provide the crew member with as close to nude body performance as possible, and to demonstrate the technology feasibility of power assisted space suit components in general. The MCP joint was selected due to its being representative of other space suit joints, such as the shoulder, hip and carpometacarpal joint, that would also greatly benefit from this technology. In order to meet this objective, a development team of highly skilled and experienced personnel was assembled. The team consisted of two main entities. The first was comprised of ILC's experienced EVA space suit glove designers, who had the responsibility of designing and fabricating a low torque MCP joint which would be compatible with power assisted technology. The second part of the team consisted of space robotics experts from the University of Maryland's Space Systems Laboratory. This team took on the responsibility of designing and building the robotics aspects of the power-assist system. Both parties addressed final system integration responsibilities.
Author
Gloves; Joints (Anatomy); Robotics; Space Suits; Systems Integration; Human Factors Engineering; Man Machine Systems; Performance Tests

19980008056 New York Univ. Medical Center, Occupational and Industrial Orthopaedic Center, New York, NY USA
Effect of Computer Mouse Design on Risk Factors for Cumulative Trauma Disorder and on Patterns of Motor Coordination of the Forearm and Wrist in Skilled and Novice Users
Barr, A. E., New York Univ. Medical Center, USA; Jan. 1997; 360p; In English
Report No.(s): PB97-207153; Copyright Waived; Avail: CASI; A16, Hardcopy; A03, Microfiche

The common, Forearm Pronated (FP) computer mouse was compared with a new Forearm Neutral (FN) computer mouse designed to reduce the risk of Cumulative Trauma Disorders (CTD). Twenty experienced mouse users and 20 novice mouse users participated in evaluations of the two mouse types. Use of the FP mouse was associated with mean forearm pronation up to maximum, high mean wrist ulnar deviation, motions, of wrist radial ulnar deviation with intermittent occurrence of maximum ulnar deviation angles, and activation of the pronators and the wrist extensors at intensities between 8% Maximum Voluntary Contraction (MVC) and 35% MVC at least 40% of the time. The FN mouse eliminated the postural and joint motion risk factors and reduced some muscular demands associated with postural risks. The FN mouse did not reduce mean wrist extension and it increased extensors carpi radialis activation to higher intensity levels. The highest speed of performance was attained with the FN mouse. Novice users demonstrated a similar rate of improvement in speed of performance with both mouse designs. Skilled

users demonstrated a remarkable degree of skill transfer. The study showed that risk factors for forearm and wrist CTD can be attributed to mouse operation as such.
NTIS
Disorders; Design Analysis; Computer Design; Musculoskeletal System

19980008522 National Inst. for Occupational Safety and Health, Div. of Education and Information, Cincinnati, OH USA
Cumulative Trauma Disorders in the Workplace: Bibliography
Proctor, B., National Inst. for Occupational Safety and Health, USA; Sep. 1995; 217p; In English
Report No.(s): PB96-192752; DHHS/PUB/NIOSH-95-119; No Copyright; Avail: CASI; A10, Hardcopy; A03, Microfiche

This publication provided a compilation of materials describing research conducted by NIOSH on cumulative trauma disorders in the workplace. Selected references, both NIOSH and non-NIOSH, were provided, concentrating on NIOSH activities in preventing work related musculoskeletal disorders, prevention and intervention research at NIOSH for work related musculoskeletal disorders, comments to the Department of Labor on OSHA proposed rule on ergonomic safety and health management, a manual for musculosketelal diseases of the upper limbs, a review of physical exercises recommended for video display tube operators, management of upper extremity cumulative trauma disorders, ergonomics and prevention of musculoskeletal injuries, and carpal tunnel syndrome. A bibliography of NIOSH publications on cumulative trauma disorders in the workplace was provided, including numbered publications, testimony, journal articles, grant reports, contract reports, and health hazard evaluations. Non-Niosh references were also listed.
NTIS
Bibliographies; Diseases; Hazards; Health; Human Factors Engineering; Physical Exercise; Safety Management; Signs and Symptoms

Subject Term Index

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